

vaporizing chamber 64, which is maintained at a negative pressure. Immediately after the discharge, the liquid material 30 is atomized so as to be fine mists, and is simultaneously vaporized, which results in generation of the material gas. At the same time, He gas as a carrier gas is injected from the gas injection port 102 of the carrier gas passage 100. Since the volume of the vaporizing chamber 64 is very large unlike the conventional vaporizer, the liquid material 30 can be vaporized very efficiently. Accordingly, the fine mists do not adhere to the inner wall of the vaporizing chamber 64, and the liquid material does not remain in the vaporizing chamber 64. Additionally, since the liquid material 30 can be efficiently vaporized, the liquid material does not decompose due to heat in the vaporizing chamber 64, thereby preventing the vaporizer itself from being closed by the deposited material produced by decomposition. As mentioned above, since the supplied liquid material can be used for deposition after being completely vaporized, a film having a designed thickness can be deposited.

IN THE CLAIMS:

Please enter amended claims 1, 4, 5, 8 and 12 as follows:

1. (Twice Amended) A vaporizer which vaporizes a liquid material under a depressurized atmosphere, the vaporizer comprising:

a liquid storing chamber temporarily storing the liquid material therein;

a vaporizing chamber set in the depressurized atmosphere;

a small aperture connecting between the liquid storing chamber and the vaporizing chamber so as to supply the liquid material to the vaporizing chamber;

a valve body located on a side of said small aperture away from said vaporizing chamber so as to open and close an inlet port of said small aperture, said inlet port being

located toward the liquid storing chamber; and

an actuator controlling a degree of opening of the valve body,

wherein said valve body is located outside of said vaporizing chamber to permit an uninhibited flow of the liquid material, thereby achieving a smooth flow of vapor of the liquid material.

4. (Amended) The vaporizer as claimed in claim 3, wherein the carrier gas introducing means includes an injecting port positioned in the vicinity of the outlet port of the small aperture so as to inject the carrier gas from a surrounding area of the outlet port in a direction substantially perpendicular to a direction of a flow of the liquid material from said inlet port to said outlet port of said small aperture.

5. (Amended) The vaporizer as claimed in claim 3, wherein the carrier gas introducing means includes an injecting port positioned in the vicinity of the outlet port of the small aperture so as to inject the carrier gas in a direction substantially opposite to a direction of a flow of the liquid material from said inlet port to said outlet port of said small aperture.

8. (Twice Amended) The vaporizer as claimed in claim 1, wherein a direction of a flow of the liquid material from said inlet port to said outlet port of said small aperture coincides with a direction of an exit of the vaporizing chamber.

12. (Amended) A semiconductor manufacturing system comprising:
a process apparatus performing a process using a vaporized material; and
a vaporizer which vaporizes a liquid material under a depressurized atmosphere so as to generate the vaporized material, the vaporizer comprising:

a liquid storing chamber temporarily storing the liquid material therein;
a vaporizing chamber set in a depressurized atmosphere;
a small aperture connecting between the liquid storing chamber and the vaporizing chamber so as to supply the liquid material to the vaporizing chamber;
a valve body located on a side of said small aperture away from said vaporizing chamber so as to open and close an inlet port of said small aperture, said inlet port being located toward the liquid storing chamber; and
an actuator controlling a degree of opening of the valve body,
wherein said valve body is located outside of said vaporizing chamber to permit an uninhibited flow of the liquid material, thereby achieving a smooth flow of vapor of the liquid material.

See the attached Appendix for the changes made to effect the claims.

Please enter new claims 13-23 as follows:

13. (New) The vaporizer as claimed in claim 1, wherein the vaporizing chamber has a conical shape so that a cross section of the vaporizing chamber increases as a distance from the small aperture increases, and a diameter of an exit end of said vaporizing chamber is equal to or greater than 12 mm.

14. (New) The vaporizer as claimed in claim 1, wherein the vaporizing chamber has a conical shape so that a cross section of the vaporizing chamber increases as a distance from the small aperture increases, and a diameter of an exit end of said vaporizing chamber falls within a range from 12 mm to 20 mm.

15. (New) The vaporizer as claimed in claim 1, wherein a diameter of said small aperture is equal to or less than 2 mm.

16. (New) The vaporizer as claimed in claim 1, wherein a diameter of said small aperture falls within a range from 0.5 mm to 2 mm.

17. (New) The vaporizer as claimed in claim 1, wherein a length of said small aperture is equal to or less than 5 mm.

18. (New) The vaporizer as claimed in claim 1, wherein a distance between an outlet port of said small aperture and an exit end of said vaporizing chamber is equal to or greater than 12 mm.

19. (New) The vaporizer as claimed in claim 1, wherein a distance between an outlet port or said small aperture and an exit end of said vaporizing chamber falls within a range from 12 mm to 20 mm.

20. (New) The vaporizer as claimed in claim 1, wherein the vaporizing chamber has a conical shape so that a cross section of the vaporizing chamber increases as a distance from the small aperture increases, and an axis of the conical shape of said vaporizing chamber coincides with a direction from the inlet port to an outlet port of said small aperture.

21. (New) The vaporizer as claimed in claim 1, further comprising carrier gas introducing means for introducing a carrier gas into the vaporizing chamber, wherein the carrier gas introducing means injects the carrier gas in the vicinity of an outlet port of the

small aperture, and a direction of injection of the carrier gas is different from a direction from the inlet port to the outlet port of said small aperture.

22. (New) A vaporizer which vaporizes a liquid material under a depressurized atmosphere, the vaporizer comprising:

a liquid storing chamber temporarily storing the liquid material therein;

a vaporizing chamber set in the depressurized atmosphere;

a small aperture connecting between the liquid storing chamber and the vaporizing chamber so as to supply the liquid material to the vaporizing chamber;

a valve body located on a side of the liquid storing chamber with respect to said small aperture so as to open and close an inlet port of said small aperture which opens in the liquid storing chamber and also to control an amount of the liquid material being supplied to said vaporizing chamber by controlling a degree of opening of the inlet port of said small aperture; and

an actuator controlling a degree of opening of the valve body.

23. (New) A semiconductor manufacturing system comprising:

a process apparatus performing a process using a vaporized material; and

a vaporizer which vaporizes a liquid material under a depressurized atmosphere so as to generate the vaporized material, the vaporizer comprising:

a liquid storing chamber temporarily storing the liquid material therein;

a vaporizing chamber set in a depressurized atmosphere;

a small aperture connecting between the liquid storing chamber and the vaporizing chamber so as to supply the liquid material to the vaporizing chamber;

a valve body located on a side of the liquid storing chamber with respect to said small

aperture so as to open and close an inlet port of said small aperture which opens in the liquid storing chamber and also to control and amount of the liquid material being supplied to said vaporizing chamber by controlling a degree of opening of the inlet port of said small aperture;
and

an actuator controlling a degree of opening of the valve body.